

# Alaska Ocean Observing System (AOOS)

**Region:** Alaska

**Date Initiated:** July 2003

(current number: NA05NOS4731078, initiated 2005)

## Brief Project Summary

The Alaska Ocean Observing System (AOOS) is the regional association for Alaska, integrating three geographically diverse regional coastal and ocean observing systems in the Gulf of Alaska, Bering Sea/Aleutian Islands, and the Arctic. Creating an integrated ocean observing system in Alaska is a unique challenge. Alaska's marine system is larger than the combined marine systems in the rest of the U.S., has extensive marine oil and gas reserves essential to the nation and national security, and includes one the most productive and valuable (approximately \$1.5 billion in 2003) marine fisheries in the world. No other observing system in the U.S. has such climate extremes, significant geographic distances, and limited infrastructure.

## Key Accomplishments

### Data Collection and Distribution

- AOOS is working closely with the National Data Buoy Center (NDBC) at the Stennis Space Center to develop prototype in-water instrumentation packages for the existing array of weather buoys. The NDBC buoys in Prince William Sound (PWS) are in the process of being upgraded with Conductivity–Temperature–Depth sensors for measuring pressure, water temperature, and salinity, and with Acoustic Doppler Current Profilers for measuring water column velocities. These instrument packages are linked to the NDBC telemetry system and the real-time data stream through NDBC quality assurance and control filters for Web dissemination.
- AOOS has developed partnerships with the U.S. Geological Survey to telemeter data from the new stream gauge on the Copper River and with the Natural Resources Conservation Service of the U.S. Department of Agriculture to deploy a series of SnoTel weather stations in PWS. These weather stations are designed to accurately measure total rain and snow accumulation and telemeter weather data in near real-time through the Alaska Meteor Burst Communications System. There are now six new stations at sea level and one at high elevation, and four more are planned for high elevation deployment next year. The stream gauge and weather stations will provide estimates for the volume of freshwater contributed by the surrounding watersheds, a principal forcing function of PWS circulation.
- Stakeholders along Alaska's North Slope are dependent on knowledge of sea ice conditions for survival and their livelihoods. A sea ice radar has been installed at Barrow with AOOS support to monitor the sea ice edge, as well as has mass balance instrumentation offshore to provide users with useful data. Custom-made Web pages display the sea ice data from satellites in a nearshore strip along the North Slope. We are working with residents along the North Slope to further refine these products and have submitted a proposal to NASA, in conjunction with the Synthetic Aperture Radar (SAR) Facility at the University of Alaska Fairbanks, to acquire additional SAR satellite data useful to Alaska residents along the North Slope.

(over)



This project is contributing to the Integrated Ocean Observing System (IOOS) by

- Expanding the capacity to collect and distribute coastal and ocean observing data in Alaska through the regional association and in partnership with federal agencies
- Developing decision-support tools in response to user needs identified by local stakeholders
- Testing and validating existing marine environmental models against historical observations



### **Decision Support**

- A suite of decision-making tools is under development for AOOS stakeholders. These include Web page maps and forecasts of weather and sea state for boaters and the maritime industry; Webcam images and graphs of local and regional weather trends and forecasts for aviators; current velocities, water temperature, and chlorophyll concentration forecasts around the perimeter of PWS for salmon hatchery operators; and high-frequency radar coverage of the central PWS basin, improved atmosphere and ocean circulation forecasts, and validated tools to compare observed conditions with predicted conditions for oil spill responders and Coast Guard search and rescue models.

### **Modeling**

- The AOOS Modeling and Analysis Group at the University of Alaska Fairbanks was established to provide improved model forecasts for the marine environment around Alaska. A prerequisite to enhanced model forecasting is model testing and validation. The group has statistically compared the Regional Atmospheric Model (RAMS) run by the Alaska Experimental Forecast Facility forecast parameters with observations, and the results are displayed on-line. The group has compared forecast parameters from the Fleet Numerical Meteorological and Ocean Climatology (FNMOC) model with observations, with the results on-line, and compared the Navy Operational Global Ocean and Atmosphere Prediction System (NOGAPS) with observations. In addition, the group has compared sea ice concentration hindcast data from nine ocean-ice models with the historical sea ice record from satellites to determine the model strengths and weaknesses. From the above analyses, most models work reasonably well, but all have areas around Alaska where model improvements should be made, particularly at smaller spatial scales.

### **Primary Contact**

Molly McCammon  
Alaska Ocean Observing System  
1007 West Third Avenue, Suite 100  
Anchorage AK 99501  
Phone: (907) 644-6703; Fax: (907) 644-6780  
E-mail: [mccammon@aoos.org](mailto:mccammon@aoos.org)

### **Project Web Site**

[www.aoos.org](http://www.aoos.org)

